

New *Euryglossa* (*Euhesma*) bees (Hymenoptera: Colletidae: Euryglossinae) associated with the Australian plant genus *Eremophila* (Myoporaceae)

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Abstract – Twenty species of *Euryglossa* (*Euhesma*) bees are described as new: *E. (E.) alicia*, *E. (E.) atra*, *E. (E.) aurata*, *E. (E.) balladonia*, *E. (E.) coppinensis*, *E. (E.) cuneifolia*, *E. (E.) granitica*, *E. (E.) macrayae*, *E. (E.) nalbarra*, *E. (E.) newmanensis*, *E. (E.) pantoni*, *E. (E.) scoparia*, *E. (E.) sturtiensis*, *E. (E.) sulcata*, *E. (E.) symmetra*, *E. (E.) walkeri*, *E. (E.) wiluna*, *E. (E.) yellowdinensis*, *E. (E.) leonora*, *E. (E.) meeka*. All are endemic Australian species collected from species of the native plant genus *Eremophila* and exhibit modified labial palps. Line drawings, scanning electron micrographs and a key enable the separation of all species. Distributions are mapped.

INTRODUCTION

Euryglossine bees are widespread in Australia and most are associated with the plant family Myrtaceae. It is now apparent that large numbers of undescribed species in the subgenus *Euhesma* Michener of the genus *Euryglossa* Smith have been collected on flowering non-Myrtaceous native plants. Many show modification of the head and mouthparts presumably as food plant adaptation. Interest in pollination mechanisms of Australian native plants has grown with the ability to make accurate identifications. Recently collected bees often bear the specific name of the flowers from which they were caught.

Examination of hundreds of *Euhesma* specimens suggest many species may be associated with specific plant species. Houston (1992) described three such species from Western Australia. It is unfortunate that all bees in collections don't carry full details but many are recorded from *Eremophila* species (Myoporaceae). This Australian plant genus of about 200 species occurs mainly in arid areas of the continent.

Dr Houston has collected widely in the huge state of Western Australia and from almost every site a different *Euhesma* species was taken on *Eremophila*. Whether the plant in each site was always a different species is not known, but *Eremophila* species are mainly shrubs with flowers that can be readily watched and, after this study, with accurate identification of both plant and bees now possible, it is hoped pollination studies will be encouraged.

In this paper, although only closely similar *Euhesma* species recorded from *Eremophila* are dealt with, they are not considered monophyletic. Based on the form of the labial palps 20 species collected from *Eremophila* spp. can be identified and these

form three groups. Males have not been collected as often as females and sex association is not always clear so the key presented is for females only.

Houston (1983) mentioned collecting many *Euhesma* with enlarged labial palps from bluish-flowered *Eremophila* species and interspecific variation relates in the main to the development of the labial palps and head length. The head may be lengthened behind the ocelli or the clypeus may be extended well beyond the level of the eyes. There is usually a clear malar space (unknown in most Euryglossinae). The whole labio-maxillary complex may be elongate or various segments of the labial palps enlarged (Figures 1-7). Apart from head shape and labial palps the species described below look very similar and some show only small structural differences concerning texture of frons or clypeus. Whether these indeed indicate species will only be known when more specimens, particularly males, become available.

METHODS

In the descriptions of species, 'relative head measurements' express most concisely the size relation between measurements on one head. Most of the specimens were coated with pollen or nectar, or were initially preserved in ethyl alcohol. Characters are obscured and some descriptions are not as complete as others.

Although the first criterion for inclusion in this paper is "collected from *Eremophila*", 3 specimens recorded here were taken elsewhere: one specimen of *E. (E.) yellowdinensis* from *Melaleuca*; and two specimens of *E. (E.) walkeri* from *Eucalyptus* sp.

All species names are to be treated as nouns in apposition to *Euhesma*.

Abbreviations

The following collection abbreviations are used:

- ANIC Australian National Insect Collection, Canberra
 MV Museum of Victoria, Melbourne
 QM Queensland Museum, Brisbane
 UQIC University of Queensland Insect Collection, Brisbane
 WAM Western Australian Museum, Perth
 RMBM R.M. Bohart Museum of Entomology, University of California, Davis

Genus *Euryglossa* Smith

Subgenus *Euhesma* Michener

Type species

Euryglossa wahlenbergiae Michener, 1965: 88 by original designation.

The following description relates to all *Euhesma* known to be associated with *Eremophila*.

Description

Medium sized (length 4–7 mm) *Euhesma* with head, thorax and propodeum black. Gaster in most dark brown with tergal margins transparent; head longer than wide and narrower than thorax; facial foveae wide, shallow, impressed (Figure 17), upper part broadened and often curved towards ocelli, reaching level of antennal sclerites; eyes converging below; antennae inserted below middle of face with pedicel as long as first two flagellar segments together, all flagellar segments except last wider than long (females), interantennal distance greater than antennocular distance; labial palps as long as or longer than maxillary palps; anterior margin of clypeus broadly truncate; face in profile nearly flat with genal areas anteriorly very narrow (Figure 8); fore tibia with conspicuous apical spine (Figure 9); female with inner hind tibial spur pectinate (Figure 10) and in spite of view shown in Figure 10, outer hind tibial spur strongly curved and shorter, thicker and heavier than inner hind tibial spur; basitibial plate indicated by carina (1 or 2) and tubercles with last tubercle half way or less along hind tibia (Figure 11), both plate and tubercles much stronger in female; tarsal claws with inner tooth (female) (Figure 12), bifid (male); foveae of second gastral tergum large, about as wide as long, diffuse, often difficult to see on dark background; wings evenly and closely covered with macrotrichia; forewing of most with first recurrent vein distal to first transverse cubital; body minutely roughened with face above antennae (Figure 13) and dorsum of thorax

consequently dull in most; scattered long white hairs on clypeus, frons, vertex, posterior genae, sides of thorax, legs, sides of propodeum, venter; dense, long, yellowish hairs on gastral tergum 5 of females.

Key to species of *Euhesma* collected on *Eremophila*

Females

1. Labial palps enormously extended, as long as or longer than head 2
 Labial palps not as long as head
 (Group 1)....13
- 2(1). Labial palps with segment 2 much shorter than segment 4 (Group 2)....6
 Labial palps with segment 2 subequal to or longer than segment 4 (Group 3)....3
- 3(2). Supraclypeal area and clypeus medianly concave; body length about 5 mm
 *E. walkeri* sp. nov.
 Neither supraclypeal area nor clypeus medianly concave; body length about 6 mm 4
- 4(3). Labial palps with segments 2 and 4 subequal in length 5
 Labial palps with segment 2 clearly longer than segment 4 *E. coppinensis* sp. nov.
- 5(4). Labial palps longer than head
 *E. macrayae* sp. nov.
 Labial palps as long as head
 *E. newmanensis* sp. nov.
- 6(2). Labial palp segment 3 clearly longer than segment 4 7
 Labial palp segment 3 not clearly longer than segment 4 8
- 7(6). Supraclypeal area, clypeus medianly and frons medianly concave
 *E. pantoni* sp. nov.
 Supraclypeal area, clypeus and frons not concave *E. alicia* sp. nov.
- 8(6). Labial palp segments 3 and 4 together much shorter than head 9
 Labial palp segments 3 and 4 together about as long as head 10
- 9(8). Body length about 5 mm
 *E. yellowdinensis* sp. nov.
 Body length about 6 mm
 *E. wiluna* sp. nov.
- 10(8). Tibiae of all legs golden
 *E. cuneifolia* sp. nov.
 Tibiae of all legs mostly dark brown 11

- 11(10). Fronto-clypeal suture clearly evident
 *E. meeka* sp. nov.
 Fronto-clypeal suture not clearly evident ... 12
- 12(11). Clypeus with a median longitudinal furrow
 *E. sulcata* sp. nov.
 Clypeus without a median longitudinal
 furrow *E. granitica* sp. nov.
- 13(1). Only known from Northern Territory and
 Queensland *E. sturtiensis* sp. nov.
 Only known from Western Australia and
 South Australia 14
- 14(13). Tibiae, tarsi and terminal gastral terga
 golden brown *E. aurata* sp. nov.
 Tibiae, tarsi and terminal gastral terga
 predominantly dark brown 15
- 15(14). Labial palp longer than antennal flagellum
 16
 Labial palp not longer than antennal
 flagellum 17
- 16(15). Supraclypeal area almost glabrous and
 highly polished *E. symmetra* sp. nov.
 Supraclypeal area neither glabrous nor
 polished *E. nalbarra* sp. nov.
- 17(15). Dorsal surface of clypeus concave medianly
 (indented) *E. atra* sp. nov.
 Dorsal surface of clypeus with a slight
 median longitudinal furrow
 *E. scoparia* sp. nov.
 Dorsal surface of clypeus in no way
 concave 18
- 18(17). Fronto-clypeal suture distinct, labial and
 maxillary palps about equal
 *E. balladonia* sp. nov.
 Fronto-clypeal suture not distinct, labial
 palps clearly longer than maxillary palps
 *E. leonora* sp. nov.

Because the size and shape of the head and labial palps are the most easily distinguishable characters of these bees, they are used to place them into the following groups:

Group 1. Eight species in which the labial palps although longer than the maxillary palps are relatively normal and not as long as the head (Figure 14). In the venation of the forewing, the first recurrent vein is mostly interstitial with the first transverse cubital. Males are described for 5 species. Species included: *E. (E) atra*; *E. (E) aurata*; *E. (E) balladonia*; *E. (E) leonora*; *E. (E) nalbarra*; *E. (E) scoparia*; *E. (E) sturtiensis*; *E. (E) symmetra*.

Group 2. Eight species with enormously extended labial palps in which segments 1 and 2 are short and dark brown and segments 3 and 4 are

long, pale white or yellowish and mostly ribbon-like (Figures 15, 17). In the venation of the forewing, the first recurrent vein is distal to the first transverse cubital. Males are known for 5 species. Species included: *E. (E) alicia*; *E. (E) cuneifolia*; *E. (E) granitica*; *E. (E) meeka*; *E. (E) pantoni*; *E. (E) sulcata*; *E. (E) wiluna*; *E. (E) yellowdinensis*.

Group 3. Four species with enormously extended labial palps in which only segment 1 is short and dark brown, segments 2, 3 and 4 are all extended and paler (Figure 16). In the venation of the forewing, the first recurrent vein is distal to the first transverse cubital. Males are recognised for 2 species in this group. They differ from others in that their heads are as wide as or wider than long (appear square). The area behind the eyes and ocelli is expanded (Figures 18, 19). Species included: *E. (E) coppinensis*; *E. (E) macrayae*; *E. (E) newmanensis*; *E. (E) walker*.

In the descriptions that follow species are arranged in alphabetical order in each of these groups.

Group 1

Euryglossa (*Euhesma*) *atra* sp. nov.

Figure 49

Material Examined

Holotype

♀, Boorabbin Rock, Western Australia, 31°12'S, 120°17'E, 4–9 October 1981, T.F. Houston, on flowers of *Eremophila* (WAM).

Description

Female

Length about 5.0 mm; wing length about 4.0 mm. Relative head measurements: width 7.7; length 8.0; clypeal length 2.4; lower interocular distance 4.5; upper interocular distance 5.0; clypeo-antennal distance 0.5; interantennal distance 1.5; antennocular distance 1.0; interocellar distance 1.4; ocellocular distance 1.3. Anterior margin of clypeus truncate, upper margin of clypeus slightly concave; malar space evident; labial palp segments in increasing lengths in the order 2, 1, 3, 4.

Frons and dorsum of thorax with dense reticulation and dull; whole of face below antennal insertions covered with dense reticulation and few punctures, clypeus with median indentation. Labial palp segments 1 and 2 dark brown, 3 and 4 yellowish.

Forewing with first recurrent vein slightly distal to first transverse cubital.

Etymology

The specific name relates to the dull black colour of head and thorax.

Euryglossa (Euhesma) aurata sp. nov.

Figure 49

Material Examined

Holotype

♀, 35 km E of Norseman, Western Australia, 32°12'S 122°04'E, 30 October 1989, K.L. Walker on *Eremophila* (MV).

Paratypes

Australia: Western Australia: 1♀, 3♂ same data as holotype (MV).

Description

Female

Length about 5.0 mm; wing length about 4.0 mm. Relative head measurements: width 6.3; length 7.1; clypeal length 1.9; lower interocular distance 3.7; upper interocular distance 4.3; interantennal distance 1.3; antennocular distance 0.7; interocellar distance 1.5; ocellocular distance 1.2. Clypeus with anterior margin indented medianly, upper margin slightly concave, dorsum shining with median longitudinal furrow; labial palps with segments in increasing lengths in the order 2, 1 = 3, 4. Labial palp segment one dark brown, others yellowish; legs dark brown with tibiae and tarsi mostly golden; dorsal surface of gaster golden brown with wide bands across segments 1–3 dark brown; venter light brown.

Forewing with first recurrent vein distal to first transverse cubital.

Male

Length about 4.0 mm; wing length about 3.0 mm. Relative head measurement: width 5.5; length 5.6; clypeal length 1.2; lower interocular distance 2.9; upper interocular distance 4.1; interantennal distance 0.9; antennocular distance 0.7; interocellar distance 1.4; ocellocular distance 1.1; ocelloccipital distance 0.1. Clypeus as in ♀; labial palps with segments in increasing lengths in the order 2, 3, 1, 4.

Labial palp segments 1, 2 dark brown, 3, 4 yellowish; legs dark brown with fore tibiae and all tarsi light brown.

Forewing with first recurrent vein interstitial with first cubital. Long white hairs on head, especially on clypeus.

Remarks

The males described are very much smaller than others in this group. They differ from the females in that colour is black predominantly and the first recurrent vein of the forewing is interstitial with the first cubital.

Etymology

The specific name refers to the golden brown colour on the gaster and legs of the female.

Euryglossa (Euhesma) balladonia sp. nov.

Figures 37, 46, 49

Material Examined

Holotype

♀, 32°12'S 123°18'E, 35 km NW by W Balladonia RH, Western Australia, 18 September 1981, I.D. Naumann and J.C. Cardale, on flowers of *Eremophila* (ANIC).

Paratypes

Australia: Western Australia: 1♀, 1♂ same data as holotype (ANIC).

Other Material

Australia: Western Australia: 7♀, 2♂, 32°27'S 121°41'E, 30 km SSW of Norseman, 19 September 1981, I.D. Naumann and J.C. Cardale, (ANIC).

Description

Female

Length about 5.5 mm; wing length about 4.0 mm. Relative head measurements: width 7.4; length 7.7; clypeal length 2.3; lower interocular distance 4.3; upper interocular distance 5.0; interantennal distance 1.7; antennocular distance 1.1; interocellar distance 1.6; ocellocular distance 1.0; ocelloccipital distance 0.1. Upper margin of clypeus straight; labial palps with segments in increasing lengths 2, 1, 3, 4; fronto-clypeal suture distinct; clypeus not smooth, but with a low sheen.

Labial palp segments 1 and 2, dark brown, 3 and 4 golden brown (all dark brown in specimens from Norseman).

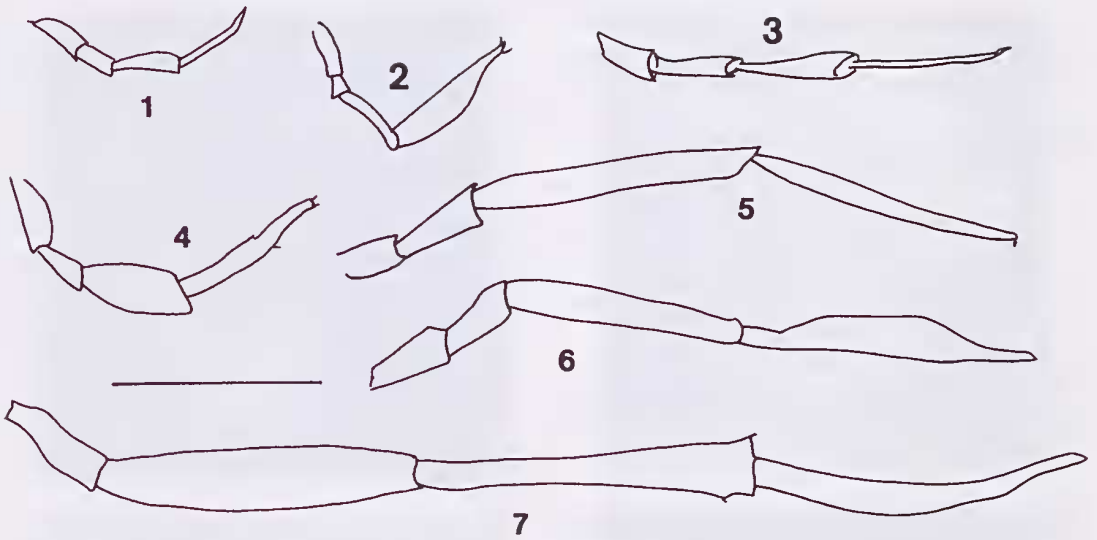
Forewing with first recurrent vein interstitial with first transverse cubital.

Male

Length about 5.0 mm; wing length about 4.0 mm. Relative head measurements: width 7.0; length 7.0; clypeal length 2.0; lower interocular distance 3.8; upper interocular distance 4.5; interantennal distance 1.2; antennocular distance 0.8; interocellar distance 1.6; ocellocular distance 0.9. Antennae long, middle flagellar segments longer than wide; basitibial plate indicated by carina and tubercles with terminal tubercle about 1/3 along hind tibia.

Forewing with first recurrent vein interstitial with first transverse cubital.

Seventh gastral sternum (Figure 37) with branched hairs on all 4 lobes. Eighth gastral sternum (Figure 46) with branched hairs laterally on distal shaft.



Figures 1-7 Labial palps of female *Euryglossa* (*Euhesma*) species collected on flowers of *Eremophila* species. 1, *E. leonora*; 2, *E. scoparia*; 3, *E. nalbarra*; 4, *E. symmetra*; 5, *E. meeka*; 6, *E. sulcata*; 7, *E. macrayae*. Scale line = 0.5mm.

Remarks

This is the only species in which the antennae of males are longer than usual with the middle flagellar segments longer than wide.

Etymology

The specific name refers to the type locality.

Euryglossa (*Euhesma*) *leonora* sp. nov.

Figures 1, 22, 23, 33, 42, 49

Material Examined

Holotype

♀, 50 km E of Leonora, Western Australia, 28°51'S 121°50'E, 10 September 1982, B. Hanich and T.F. Houston, on flowers of *Eremophila pantonii* (WAM).

Paratypes

Australia: Western Australia: 1♀, same data as holotype (WAM).

Other Material

Australia: Western Australia: 1♀, 9♂, 4 miles (6.4 km) NE of Menzies, 2 September 1971, T.F. Houston, on blue *Eremophila* (WAM).

Description

Female

Length about 5.5 mm; wing length about 4.0 mm. Relative head measurements: width 7.4; length 8.0;

lower interocular distance 4.3; upper interocular distance 4.9; interantennal distance 1.4; antennocular distance 0.9; interocellar distance 1.9; ocellocular distance 1.2; ocelloccipital distance 0.1. Anterior margin of clypeus broadly truncate; labial palps slightly longer than maxillary palps with segments in increasing lengths in the order 2, 1, 3, 4 (Figure 1); malar space short; horizontal zone of propodeum longer than metanotum; clypeus shining with punctures wide apart; frons above antennae dull.

Head black with antennal flagella yellowish ventrally; labial palps with segments 1, 2 dark brown, segments 3 and 4 light brown with basal parts dark brown; legs dark brown with fore tibiae anteriorly and all tarsi yellowish.

Forewing with first recurrent vein interstitial with first transverse cubital.

Scattered long white hairs on frons, clypeus, vertex, mandibles, posterior genae, sides of thorax, legs, venter, gastral tergum 5.

Male

Length about 4.5 mm; wing length about 3.7 mm. Relative head measurements: width 5.1; length 5.1; clypeal length 1.5; lower interocular distance 2.6; upper interocular distance 3.5; clypeo-antennal distance 0.3; interantennal distance 0.9; antennocular distance 0.6; interocellar distance 1.3; ocellocular distance 0.9; ocelloccipital distance 0.1. Labial palps and forewings as in female; inner hind tibial spur finely pectinate; horizontal zone of propodeum sloping, longer than metanotum; frons above antennae dullish with close reticulation and close punctures.

Terminalia (Figures 22, 23, 33, 42). The seventh gastral sternum (Figure 33) seems quite unlike any others examined.

Etymology

The specific name refers to the type locality.

Euryglossa (Euhesma) nalbarra sp. nov.

Figures 3, 10, 14, 20, 21, 31, 32, 40, 41, 49

Material Examined

Holotype

♀, 7 km W. Nalbarra HS, Western Australia, 28°39'S 117°36'E, 29–30 August 1981, T.F. Houston, on flowers of *Eremophila* affin. *georgei* (WAM).

Paratypes

Australia: Western Australia: 10♀, 2♂, same data as holotype (WAM); 10♀, 4♂, 26 miles (41.6 km) SSE of Wiluna, 1 November 1971, T.F. Houston, on blue *Eremophila* (WAM); 1♀, 9 km ENE of Anketell HS, 28°02'S 118°51'E, 3–6 September 1981, T.F. Houston, on flowers of *Eremophila* cf. *spinosa* (WAM).

Description

Female

Length about 7.0 mm; wing length about 5.0 mm. Relative head measurements: width 8.6; length 10.1; clypeal length 3.9; lower interocular distance 5.5; upper interocular distance 5.8; interantennal distance 1.8; antennocular distance 1.2; interocellar distance 2.1; ocellocular distance 1.5; ocelloccipital distance 0.8. Anterior margin of clypeus indented medianly, upper margin of clypeus concave; malar space distinct, labial palps longer than maxillary palps with segments in increasing lengths 1 = 2, 3, 4, all segments subcylindrical (Figures 3, 14); horizontal zone of propodeum sloping, longer than metanotum; clypeus shining with punctures wide apart; foveae of 2nd segment of gaster about twice as long as wide.

Head black, antennae with scapes and pedicels black, flagella black dorsally, yellowish ventrally; labial palps with segments 1 and 2 dark brown, segments 3 and 4 brown; legs dark brown with all tarsi yellowish.

Forewing with first recurrent vein interstitial with first transverse cubital. Scattered long white hairs on frons, vertex, posterior genae, sides of thorax and propodeum, legs, venter; long, golden hairs on gastral tergum 5.

Male

Length about 5.5 mm; wing length about 4.0 mm. Relative head measurements: width 7.6; length 8.4;

clypeal length 2.6; lower interocular distance 4.4; upper interocular distance 5.2; interantennal distance 1.3; antennocular distance 0.9; interocellar distance 2.0; ocellocular distance 1.1, ocelloccipital distance 0.4. Anterior margin of clypeus broadly truncate, upper margin of clypeus slightly concave; labial palps as in female; inner hind tibial spur ciliate; horizontal zone of propodeum longer than metanotum; frons above antennae dullish, covered with very close reticulation, punctures not obvious. Colour as in female with fore femora yellowish anteriorly. Forewing as in female. Scattered long white hairs on frons, vertex, clypeus, antennal scapes, mandibles, posterior genae, sides of thorax and propodeum, legs.

Terminalia (Figures 20, 21, 31, 32, 40, 41). The seventh gastral sternum (Figures 31, 32) has long branched hairs on only two lobes.

Etymology

The species is named from the type locality.

Euryglossa (Euhesma) scoparia sp. nov.

Figures 2, 49

Material Examined

Holotype

♀, N Middleback Range, South Australia, 137°09'E 33°03'S, 7–8 October 1973, on *Eremophila scoparia*, C.A. & T.F. Houston (WAM).

Paratypes

Australia: Western Australia: 1 ♀, same data as holotype (WAM); 1 ♀, 4.5 km NNE of Mt Jackson (119°07'E 30°59'S), 5–11 September 1979, T.F. Houston *et al.*, on flowers of *Eremophila* ?*scoparia* (WAM); 1 ♀, 31°18'S 119°44'E, 6 km E of Yellowdine, 10 October 1981, I.D. Naumann and J.C. Cardale on flowers of *Eremophila* (ANIC).

Other Material

Australia: Western Australia: 2 ♀, 18 km WSW Mulline, 29°51'S 120°20'E, 23 September 1982, B. Hanich and T.F. Houston, on flowers of *Eremophila pantonii* (WAM).

Description

Female

Length about 6.0 mm; wing length about 4.5 mm. Relative head measurements: width 7.5; length 9.5; clypeal length 3.0; lower interocular distance 4.2; upper interocular distance 5.0; clypeo-antennal distance 0.8; interantennal distance 1.4; antennocular distance 0.9; interocellar distance 1.9; ocellocular distance 1.4; ocelloccipital distance 0.2. Upper margin of clypeus straight, labial palps



Figures 8–13 *Euryglossa* (*Euhesma*) species. 8, Head of *E. macrayae* ♂; 9, Apex of tibia and base of tarsus of foreleg of *E. pantoni* ♂ (x 260); 10, Hind tibial spurs of *E. nalbarra* ♀ (x 260); 11, Hind tibia of *E. coppinensis* ♂ showing basitibial plate (x 80); 12, Distitarsus and claw of midleg of *E. macrayae* ♀ (x 280); 13, Head of *E. pantoni* ♂.

(Figure 2) longer than maxillary palps, with segments in increasing lengths 2 (very small), 1, 3, 4; malar space distinct; horizontal zone of propodeum longer than metanotum; clypeus with a slight median longitudinal furrow and punctures wide apart. Labial palp segment 1 dark brown, segments 2–4 yellowish; legs dark brown.

Etymology

The specific name refers to the species of *Eremophila* on which the types were taken.

Euryglossa (Euhesma) sturtiensis sp. nov.

Figures 39, 45, 49

Material Examined

Holotype

♀, 30 km along Haasts Bluff Road, Northern Territory, 23°29'17"S 132°07'41"E) 11 October 1995, K. Walker, on *Eremophila* (MV).

Paratypes

Australia: Northern Territory: 9 ♀, 4 ♂, same data as holotype (UQIC, ANIC, MV).

Other Material

Australia: Northern Territory: 1 ♀, 11 ♂, 41 km N Hermansberg, 23°49'29"S 132°25'37"E, 9 October 1995, K. Walker on *Eremophila sturtii*; 7 ♀, 3 km N Running Waters, 24°17'10"S 132°54'50"E, 15 October 1995, K. Walker, on *Eremophila*; 1 ♀, 2 ♂, Illamurta Springs, 24°18'S 132°31'E, 10 October 1994, K. Walker, on *Eremophila* (Finke No. 1028); 2 ♀, 1 ♂, same data at 24°18'31"S 132°41'45"E, on 15 October 1995; 5 ♀, Stokes Creek, Watarrka, 24°24'16"S 131°46'19"E, 19 October 1994, K. Walker, on *Eremophila* (Watarrka No.300); 1 ♂, 91 km N Eralunda, 24°28'00"S 133°18'59"E, 7 October 1995, K. Walker, on *Eremophila*; 6 ♀, 5 ♂, 58 km NE Curtin Springs, 25°06'32"S 132°15'18"E, 19 October 1996, K. Walker & K. Sparks, on *Eremophila* (all in MV). Queensland: 40 ♀, Dynevor Lakes, 88 km W Eulo 28°05'S 144°12'E, 27 September 1991, G. Daniels, on *Eremophila sturtii*; 1 ♀, Nine Mile Bore, 16 km E. Eulo 28°07'S 145°11'E, same data (all in UQIC).

Description

Female

Length about 5.0 mm; wing length about 4.0 mm. Relative head measurements: width 6.3; length 7.7; clypeal length 2.2; lower interocular distance 3.6; upper interocular distance 4.2; interantennal distance 1.2; antennocular distance 0.8; interocellar distance 1.4; ocellocular distance 1.2; ocelloccipital distance 0.3. Labial palps longer than maxillary

palps with segments in increasing lengths in the order 2, 1, 3, 4; malar space distinct, clypeus and supraclypeal area shining, frons above antennae dull, with close reticulation and wide apart punctures.

Labial palp segments 1 and 2 dark brown, 3 and 4 yellowish; legs dark brown with tibiae and tarsi mainly yellowish. Dorsal surface of gaster variable – in most golden with wide transverse bands of dark brown across segments 1–4.

Forewing with first recurrent vein distal to first transverse cubital.

Male

Length about 4.0 mm; wing length about 3.0 mm. Relative head measurements: width 5.5; length 7.0; clypeal length 2.0; lower interocular distance 3.0; upper interocular distance 3.9; interantennal distance 0.9; antennocular distance 0.6; interocellar distance 1.4; ocellocular distance 1.0; ocelloccipital distance 0.2. Labial palps as in female. Colour more yellow (light brown) than female on anterior margin of clypeus, labrum, legs and venter; last gastral tergum polished, yellow. Forewing as in female. Terminalia as in Figures 39 and 45. Eighth gastral tergum with distal shaft short and stout with hairs lateral only.

Remarks

The Queensland specimens (only females known) tend to be larger and more variable in colour than those from the Northern Territory. They may represent another species.

Etymology

The specific name refers to the plant from which some of the specimens were collected.

Euryglossa (Euhesma) symmetra sp. nov.

Figures 4, 49

Material Examined

Holotype

♀, 13 miles (20.8 km) E of Meekatharra, Western Australia, 31 August 1971, T.F. Houston, on blue *Eremophila* (WAM).

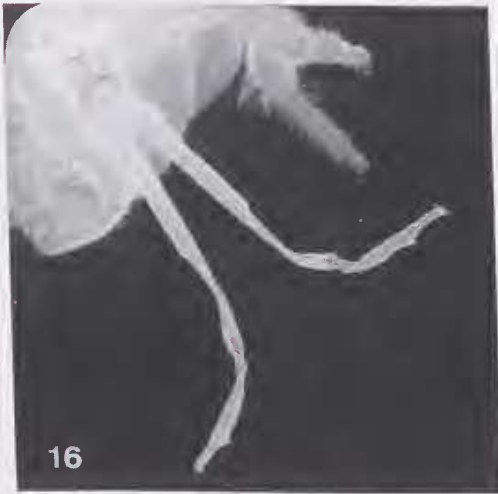
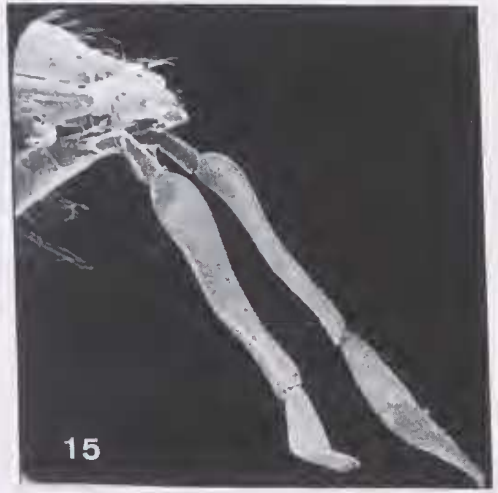
Paratype

Australia: Western Australia: 1 ♀, same data as holotype (WAM).

Description

Female

Length about 6.8 mm; wing length about 4.0 mm. Relative head measurements: width 7.8;



Figures 14–19 Head and mouth parts of *Euryglossa* (*Euthesma*) species: 14, *E. nalbarra* ♀; 15, *E. pantoni* ♀; 16, *E. macrayae* ♀; 17, *E. sulcata* ♀; 18, *E. macrayae* ♂; 19, *E. coppinensis* ♂;

length 9.2; lower interocular distance 4.7; upper interocular distance 5.5; interantennal distance 1.6; antennocular distance 1.1; interocellar distance 1.9; ocellocular distance 1.6; ocelloccipital distance 0.4. Clypeus extended well below lower ends of eyes; anterior margin of clypeus indented medianly; labial palps (Figure 4) longer than maxillary palps, segments of increasing length in the order 2, 1, 3, 4, segment 3 broadest; malar space distinct; horizontal zone of propodeum about as long as metanotum; clypeus and supraclypeal area highly polished.

Labial palps with segments 1 and 2 dark brown, segments 3 and 4 golden; legs dark brown with tarsi yellow-brown.

Forewing with first recurrent vein slightly distal to first transverse cubital.

Scattered long white hairs on face, scapes, genae posteriorly, vertex, dorsum of thorax, sides of propodeum; longer scattered white hairs on sides of thorax, legs, posterior half of gastral sterna, long brown hairs on last two gastral terga.

Etymology

The specific name meaning 'similar' refers to the similarity of this species with *nalbarra*.

Group 2

Euryglossa (Euhesma) alicia sp. nov.

Figure 50

Material Examined

Holotype

♀, 53 km E by N of Alice Springs, Northern Territory, 23°35'S 134°22'E, 6 October 1978, J.C. Cardale, on *Eremophila* sp. (ANIC).

Description

Female

Length about 7.0 mm; wing length about 5.0 mm. Relative head measurements: width 8.7; length 10.0; lower interocular distance 5.2; upper interocular distance 5.7; interantennal distance 1.9; antennocular distance 1.0; interocellar distance 1.9; ocellocular distance 1.5. Labial palps longer than head, segments in increasing length in the order 1 = 2, 4, 3, with 1 and 2 dark brown, 3 and 4 ribbon-like and yellowish; fronto-clypeal suture not evident; supraclypeal area flat. Legs dark brown.

Etymology

The specific name refers to the area near which the holotype was taken.

Euryglossa (Euhesma) cuneifolia sp. nov.

Figure 50

Material Examined

Holotype

♀, 16 km WSW of Lyons River Homestead, Western Australia, 24°38'S 115°20'E, 30 August - 1 September 1980, C.A. Howard and T.F. Houston, on *Eremophila cuneifolia* [sic.] Kraenzlin (WAM).

Paratype

Australia: Western Australia: 1♀, same data as holotype (WAM).

Other Material

Australia: Western Australia: 1♀, 14 miles (22.4 km) NE of Newman, 28 August 1971, on *Eremophila* (WAM).

Description

Female

Length about 7.0 mm; wing length about 5.0 mm. Relative head measurements: width 8.5; length 10.0; lower interocular distance 5.3; upper interocular distance 6.0; interantennal distance 1.9; antennocular distance 1.1; interocellar distance 2.0; ocellocular distance 1.5. Anterior margin of clypeus slightly indented; fronto-clypeal suture faint; facial foveae wide, shallow; malar space short; frontal line distinct; frons above antennae dull with fine reticulation and sparse punctures; clypeus and supraclypeal area shining; foveae of second tergum of gaster difficult to see, about as wide as long; labial palp segments in increasing lengths 1 = 2, 3, 4, with segments 3 and 4 ribbon-like.

Labial palps with segments 1 and 2 dark brown, segments 3 and 4 yellowish; legs dark brown with tibiae and tarsi golden; dorsal surface of gaster with transparent tergal margins giving almost a banded appearance.

Scattered long white hairs particularly on ventral body surface and legs; dense long golden hairs on gastral tergum 5.

Etymology

The specific name refers to the species of *Eremophila* from which the types were collected.

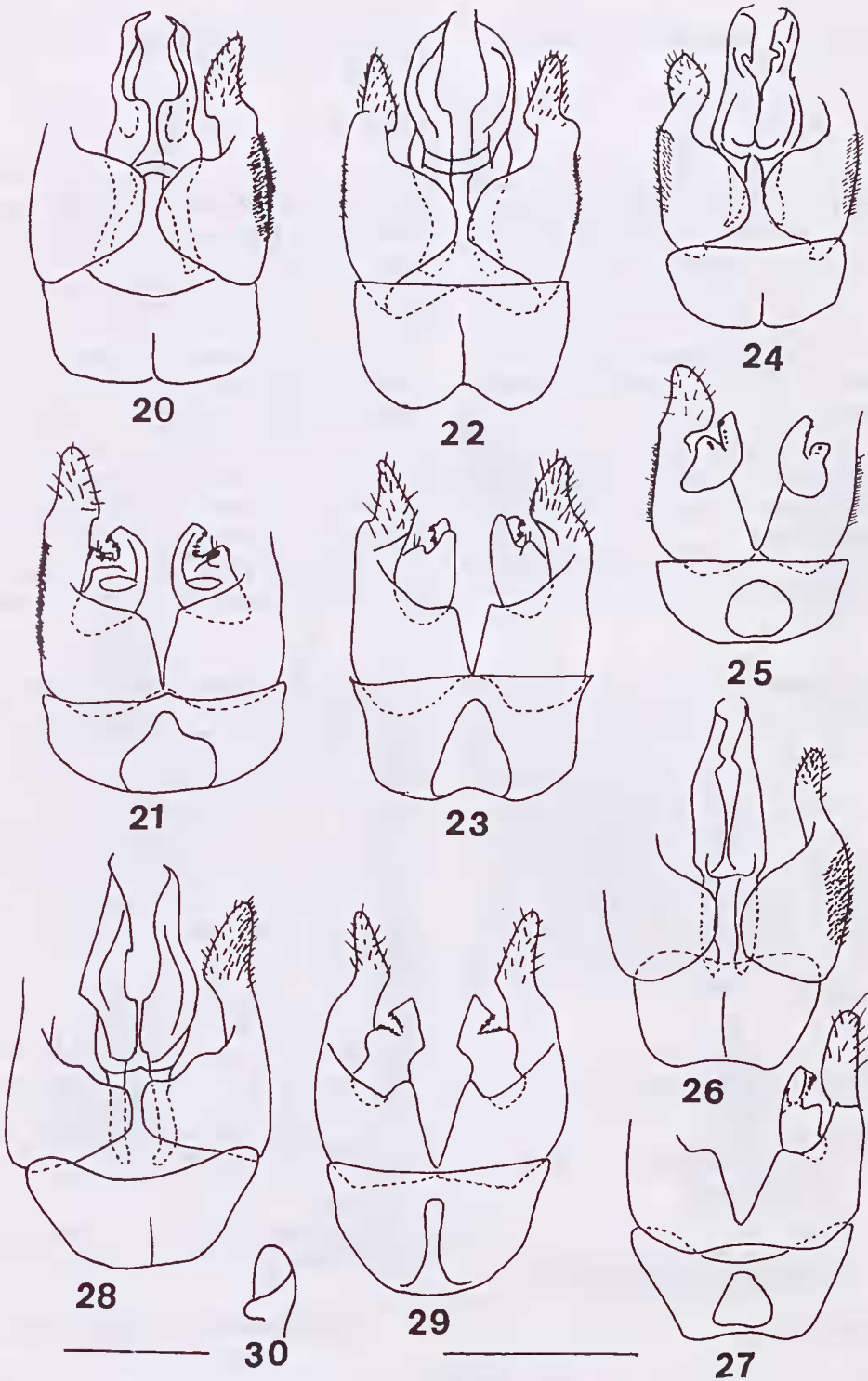
Euryglossa (Euhesma) granitica sp. nov.

Figure 50

Material Examined

Holotype

♀, 22 km S of Mt Magnet, Western Australia, 28°04'S 117°51'E, 6 September 1980, C.A. Howard and T.F. Houston, on flowers of *Eremophila granitica* S. Moore (WAM).



Figures 20-30 Male genitalia of *Euryglossa* (*Euhesma*) species. (20-29 dorsal and ventral views): 20, 21, *E. nalbarra*; 22, 23, *E. leonora*; 24, 25, *E. meeka*; 26, 27, *E. sulcata*; 28, 29, *E. macrayae*; 30, cup-like tip of gonocoxite of *E. coppinensis*. Scale lines = 0.5mm. Line on left refers to Figure 30 only.

Paratypes

Australia: Western Australia: 1 ♀, 2 ♂, same data as holotype (WAM, UQIC).

Description*Female*

Length about 6.0 mm; wing length about 4.0 mm. Relative head measurements: width 7.3; length 9.1; clypeal length 2.7; lower interocular distance 4.7; upper interocular distance 4.8; interantennal distance 1.3; antennocular distance 0.8; interocellar distance 1.5; ocellocular distance 1.3; ocellocipital distance 0.5. Anterior margin of clypeus truncate, clypeus in side view somewhat convex; frontal line distinct; labial palps as long as head with segments in increasing lengths in the order 2, 1, 3 = 4; basitibial plate with terminal tubercle about 1/3 length of hind tibia; horizontal zone of propodeum longer than metanotum; frons and clypeus shining with punctures quite far apart; almost no sign of fronto-clypeal suture.

Colour dark brown with antennal flagellum anteriorly, labial segments 3 and 4, tibial bases and all tarsi yellowish.

Male

Length about 6.0 mm; wing length about 4.0 mm. Relative head measurements: width 7.7; length 8.7; clypeal length 2.4; lower interocular distance 4.8; upper interocular distance 5.2; clypeo-antennal distance 0.7; interantennal distance 1.2; antennocular distance 1.1; interocellar distance 1.7; ocellocular distance 1.6; ocellocipital distance 0.6. Anterior margin of clypeus truncate; frontal line distinct; labial palps as in female, basitibial plate surrounded by a carina, about 1/5 length of hind tibia. Dark brown with antennal flagellum anteriorly, labial segments 3 and 4, tibial bases and all tarsi yellowish. Clypeus dorsally with many long white hairs.

Remarks

This species is very similar to *E. meeka*.

Etymology

Its name refers to the species of *Eremophila* from which it was collected.

Euryglossa (Euhesma) meeka sp. nov.

Figures 5, 24, 25, 34, 43, 50

Material Examined*Holotype*

♀, 13 miles (20.8 km) E of Meekatharra, Western Australia, 31 August 1971, T.F. Houston, on blue *Eremophila* (WAM).

Paratypes

Australia: Western Australia: 1 ♀, 8 ♂, same data as holotype (WAM, UQIC).

Description*Female*

Length about 6.0 mm; wing length about 4.0 mm. Relative head measurements: width 7.7; length 9.2; clypeal length 2.7; lower interocular distance 4.8; upper interocular distance 5.2; clypeo-antennal distance 0.7; interantennal distance 1.5; antennocular distance 1.1; interocellar distance 1.8; ocellocular distance 1.5; ocellocipital distance 0.6. Anterior margin of clypeus broadly truncate, fronto-clypeal suture evident; frontal line distinct; labial palps (Figure 5) as long as head, with segments in increasing lengths in the order 2, 1, 4, 3; horizontal zone of propodeum longer than metanotum; frons above antennae not dull, covered with fine reticulation and sparse punctures; clypeus crumpled looking with indistinct median longitudinal furrow.

Labial palps with segments 1 and 2 dark brown, segments 3 and 4 pale yellow; legs dark brown with fore tibiae anteriorly and all tarsi golden.

Male

Length about 5.5 mm; wing length about 3.8 mm. Relative head measurements: width 7.7; length 8.5; clypeal length 2.4; lower interocular distance 4.5; upper interocular distance 5.0; interantennal distance 1.2; antennocular distance 1.1; interocellar distance 1.7; ocellocular distance 1.3; ocellocipital distance 0.7. Frontal line distinct; upper margin of clypeus faint, almost straight; labial palps as in female; facial foveae indistinct; basitibial plate margined by incomplete carinae, about 1/4 length of hind tibia; inner hind tibial spur finely pectinate; horizontal zone of propodeum longer than metanotum; frons above antennae dullish, covered with close reticulation and scattered punctures; clypeus with median longitudinal furrow in basal half; foveae of second segment of gaster indistinct. Scattered long white hairs on clypeus, mandibles, scapes, posterior genae, vertex, dorsum of thorax, sides of thorax, legs, posterior margins of gastral sterna 3–5. Terminalia as in Figures 24, 25, 34, 43.

Etymology

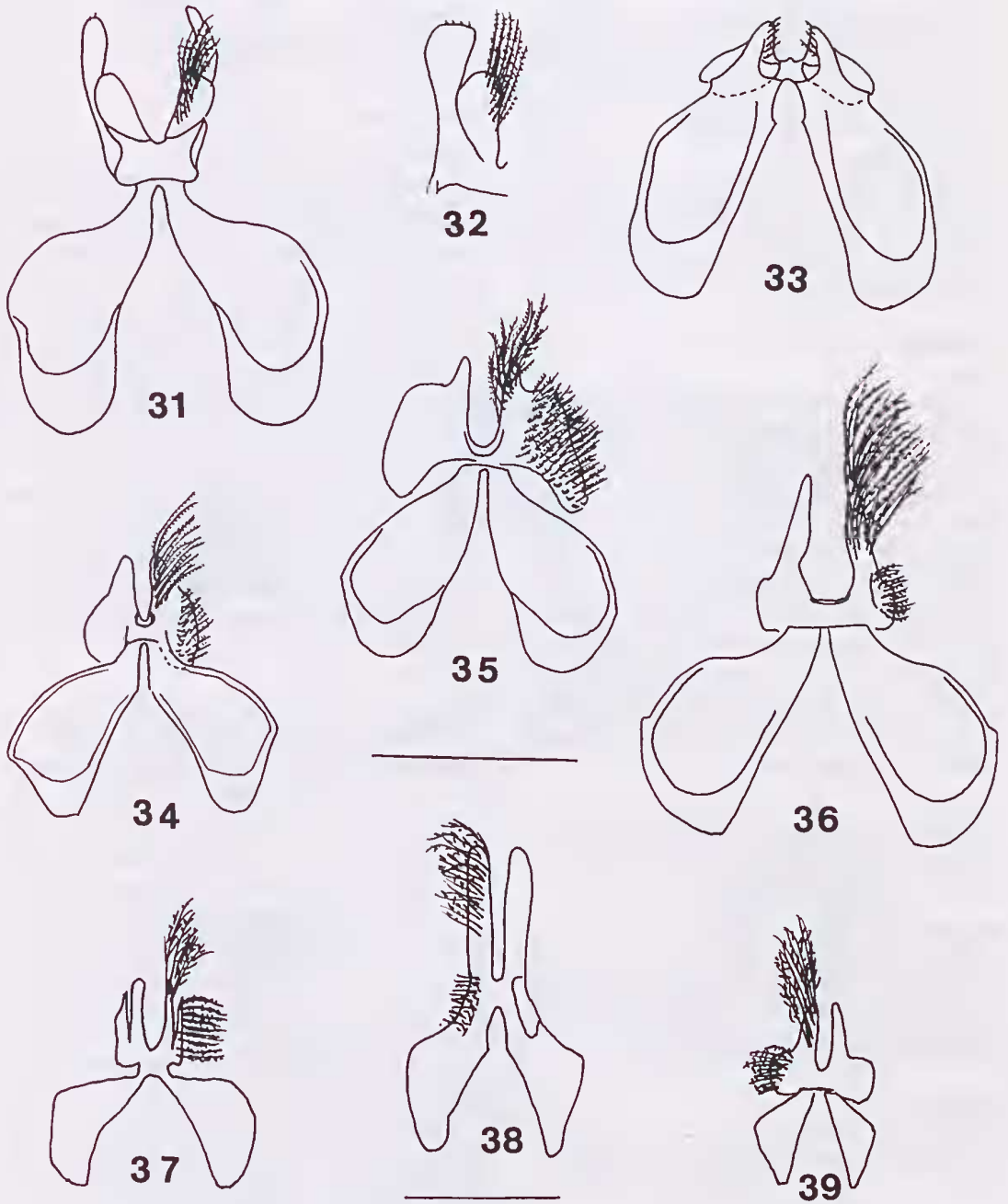
The specific name refers to 'Meekatharra' the type locality.

Euryglossa (Euhesma) pantoni sp. nov.

Figures 9, 13, 15, 50

Material Examined*Holotype*

♀, 18 km WSW Mulline, Western Australia,



Figures 31-39 Seventh gastral sternum of males of *Euryglossa* (*Euhesma*) species (31, 33-39 ventral view with pubescence omitted on one side; 32, lateral view). 31, 32, *E. nalbarra*; 33, *E. leonora*; 34, *E. meeka*; 35, *E. sulcata*; 36, *E. macrayae*; 37, *E. balladonia*; 38, *E. coppinensis*; 39, *E. sturtiensis*. Scale lines = 0.5mm. Upper line refers to Figures 31-36; lower line refers to Figures 37-39.

29°51'S 120°20'E, 23 September 1982, B. Hanich and T.F. Houston, on *Eremophila pantonii* (WAM).

Paratypes

Australia: Western Australia: 6 ♀, 4 ♂, same data as holotype; 2 ♀, 5 ♂, Meleya Well 28°58'S 117°12'E, Thundelarra Station, 28 August - 2 September 1981, T.F. Houston, on *Eremophila pantonii* (WAM, UQIC, ANIC).

Other Material

Australia: Western Australia: 15 ♂, 50 km E of Leonora, 28°51'S 121°50'E, 10 September 1982, B. Hanich and T.F. Houston, on *Eremophila pantonii* (WAM); 1 ♂, Tallering Station, September 1976, R.P. McMillan (WAM).

Description

Female

Length about 6.0 mm; wing length about 5.0 mm. Relative head measurements: width 7.2; length 9.0; length labial palp approximately 10.0; lower interocular distance 4.6; upper interocular distance 4.9; interantennal distance 1.4; antennocular distance 1.0; interocellar distance 1.8; ocellocular distance 1.3; ocellocipital distance 0.7. Fronto-clypeal suture indistinct, labial palp segments of increasing lengths in the order 1, 2, 4, 3, with 1 and 2 dark brown, 3 and 4 ribbon-like, whitish, segment 3 expanded basally (Figure 15), malar space evident; dorsum of head covered with fine reticulation, shining; supraclypeal area and clypeus medianly concave and brilliantly shining. Legs dark brown with distal end of femora, fore tibiae and all tarsi pale yellowish.

Male

Similar to female with more extensive long white hair on body. In specimens from Leonora, the gastral tergum 6 is wholly yellow (partially so in others).

Remarks

My theory that species of *Eremophila* are attended by bee species with mouthparts suitably modified is shaken by this species. It was taken at the same time as the species *E. leonora* which shows no marked lengthening of head or labial palps.

Etymology

The specific name refers to the species of *Eremophila* from which the bees were collected.

Euryglossa (Euhesma) sulcata sp. nov.

Figures 6, 17, 26, 27, 35, 44, 50

Material Examined

Holotype

♀, 85 miles (136 km) NNE of Meekatharra,

Western Australia, 30 August 1971, T.F. Houston, on blue *Eremophila* (WAM).

Paratypes

Australia: Western Australia: 9♀, 2♂, same data as holotype (WAM, UQIC).

Description

Female

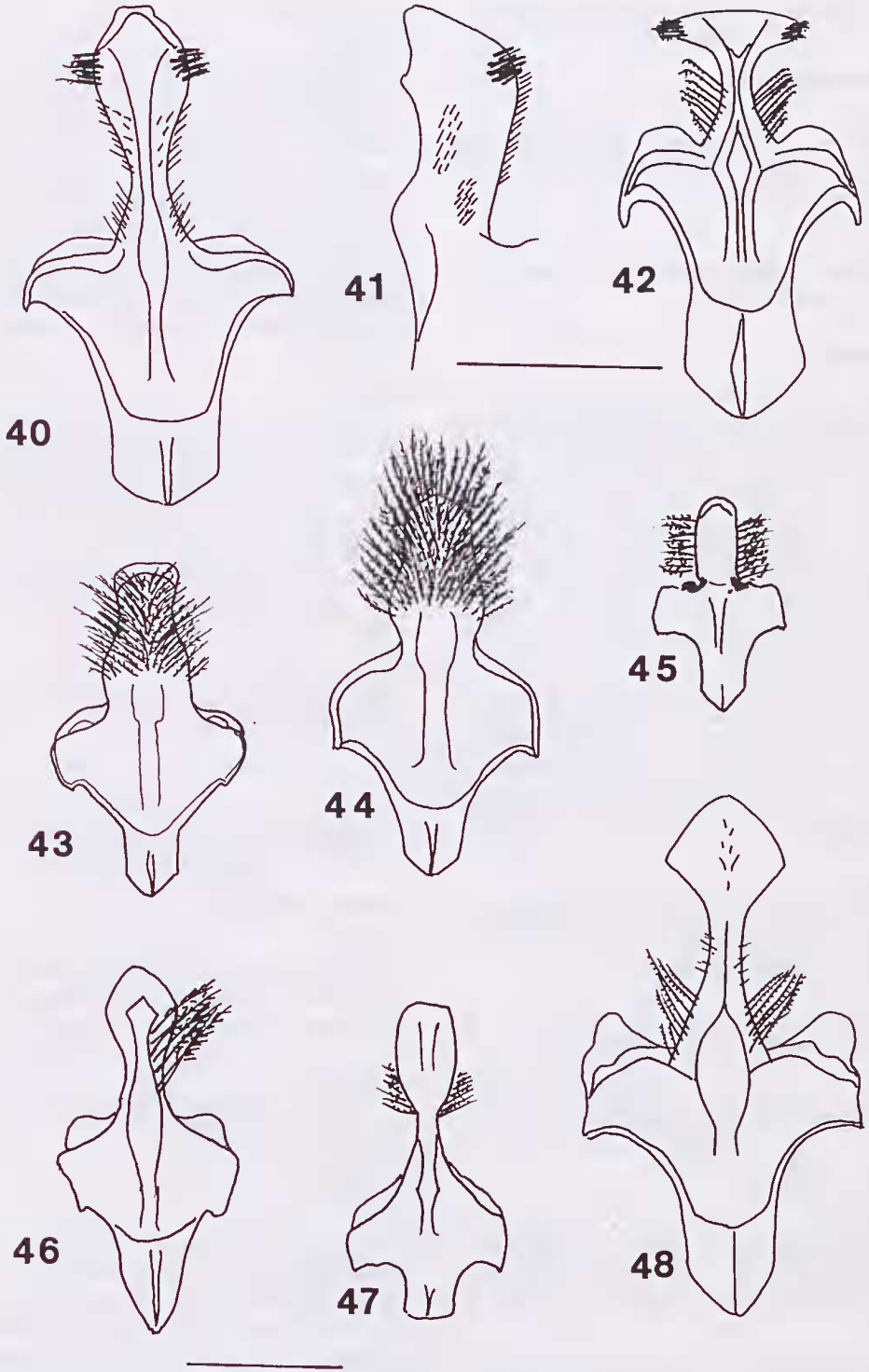
Length about 6.5 mm; wing length about 4.5 mm. Relative head measurements: width 8.0; length 9.5; clypeal length 2.3; lower interocular distance 5.2; upper interocular distance 5.4; clypeo-antennal distance 0.4; interantennal distance 1.9; antennocular distance 1.0; interocellar distance 1.8; ocellocular distance 1.5; ocellocipital distance 1.0. Anterior margin of clypeus indented medianly, upper margin of clypeus indistinct, almost straight; clypeus with median longitudinal furrow; labial palps (Figures 6, 17) as long as head, segments of increasing length in the order 1 = 2, 3, 4, segments 1 and 2 dark brown, segments 3 and 4 expanded, ribbon-like, golden; horizontal zone of propodeum longer than metanotum; frons above antennae covered with close reticulation and sparse punctures, interspaces shining; clypeus and supraclypeal area shining. Legs dark brown with tarsi golden.

Male

Length about 5.5 mm; wing length about 4.2 mm. Relative head measurements: width 8.9; length 9.0; clypeal length 2.4; lower interocular distance 5.7; upper interocular distance 6.0; clypeo-antennal distance 0.4; interantennal distance 1.7; antennocular distance 1.4; interocellar distance 2.0; ocellocular distance 1.6; ocellocipital distance 1.1. Anterior margin of clypeus slightly indented medianly, upper margin of clypeus indistinct, slightly concave; clypeus with median longitudinal furrow; labial palps as in female; facial foveae broad, shallow depressions, indistinct; basitibial plate margined by incomplete carinae and tubercles, about 1/3 length of hind tibia; inner hind tibial spur finely pectinate; horizontal zone of propodeum longer than metanotum; frons above antennae covered with close reticulation, punctures more numerous and closer together than in female; foveae of second tergum of gaster indistinct. Colour as in female with fore tibiae golden. Terminalia as in Figures 26, 27, 35, 44.

Etymology

The specific name is from Latin and refers to the furrow medianly on the clypeus.



Figures 40-48 Eighth gastral sternum of males of *Euryglossa* (*Euesma*) species (40, 42-48, ventral view; 41, lateral view). 40, 41, *E. nalbarra*; 42, *E. leonora*; 43, *E. meeka*; 44, *E. sulcata*; 45, *E. sturtiensis*; 46, *E. balladonia*; 47, *E. coppineusis*; 48, *E. macrayae*. Scale lines = 0.5mm. Lower line refers to Figures 45-47 only.

Euryglossa (Euhesma) wiluna sp. nov.

Figure 50

Material Examined

Holotype

♀, 26 miles (41.6 km) SSE of Wiluna, Western Australia, 1 September 1971, T.F. Houston, on blue *Eremophila* (WAM).

Paratypes

Australia: Western Australia: 3♀, same data as holotype (WAM, UQIC).

Description

Female

Length about 6.0 mm; wing length about 4.0 mm. Relative head measurements: width 7.5; length 9.5; clypeal length 2.4; lower interocular distance 4.5; upper interocular distance 5.2; clypeo-antennal distance 0.4; interantennal distance 1.5; antennocular distance 1.1; interocellar distance 1.9; ocellular distance 1.4. Anterior margin of clypeus slightly indented, upper margin of clypeus concave; malar space very short; frons above antennae with close reticulation and sparse punctures; foveae of second tergum of gaster about 3/5 as wide as long; labial palp segments in increasing lengths 1 = 2, 3, 4 with segments 1 and 2 dark brown, segment 3 and basal 2/3 of 4 ribbon-like and yellowish; clypeus shining; supraclypeal area shining, concave. Legs mostly dark brown with tarsi golden.

Remarks

This species is very similar to *E. yellowdinensis* except in size. Until males are discovered, their relationship remains uncertain.

Etymology

The specific name refers to the type locality.

Euryglossa (Euhesma) yellowdinensis sp. nov.

Figure 50

Material Examined

Holotype

♀, 31°18'S 119°44'E, 6 km E of Yellowdine, Western Australia, 10 October 1981, I.D. Naumann, J.C. Cardale, on flowers of *Eremophila* (ANIC).

Paratypes

Australia: Western Australia: 6♀, 17♂, same data as holotype (ANIC, WAM, UQIC); 1 ♀, same data as holotype on *Melaleuca* (ANIC).

Description

Female

Length about 5.0 mm; wing length about 4.00 mm. Relative head measurements: width 6.9; length 7.5; clypeal length 2.3; lower interocular distance 3.8; upper interocular distance 4.7; clypeo-antennal distance 0.3; interantennal distance 1.3; antennocular distance 0.9; interocellar distance 1.6; ocellular distance 1.2; ocelloccipital distance 0.4. Labial palps as long as head with segments of increasing lengths in the order 1, 2, 3, 4 with 1 and 2 dark brown and 3 and 4 ribbon-like, yellowish. Legs dark brown with fore tibiae anteriorly and all tarsi golden.

Male

Length about 4.0 mm; wing length about 3.0 mm. Relative head measurements: width 6.3; length 6.7; clypeal length 1.5; lower interocular distance 3.4; upper interocular distance 4.2; clypeo-antennal distance 0.6; interantennal distance 1.2; antennocular distance 0.7; interocellar distance 1.6; ocellular distance 0.7. Colour as in female with more yellow on legs (mid tibiae anteriorly and bases of all tibiae).

Etymology

The specific name refers to the only locality known for this species.

Group 3

Euryglossa (Euhesma) coppinensis sp. nov.

Figures 19, 30, 38, 47, 51

Material Examined

Holotype

♀, Coppin Pool area, 30 km S of Mt Bruce, NW Div., Western Australia, 10–13 May 1980, T.F. Houston *et al.*, on flowers of *Eremophila* (WAM).

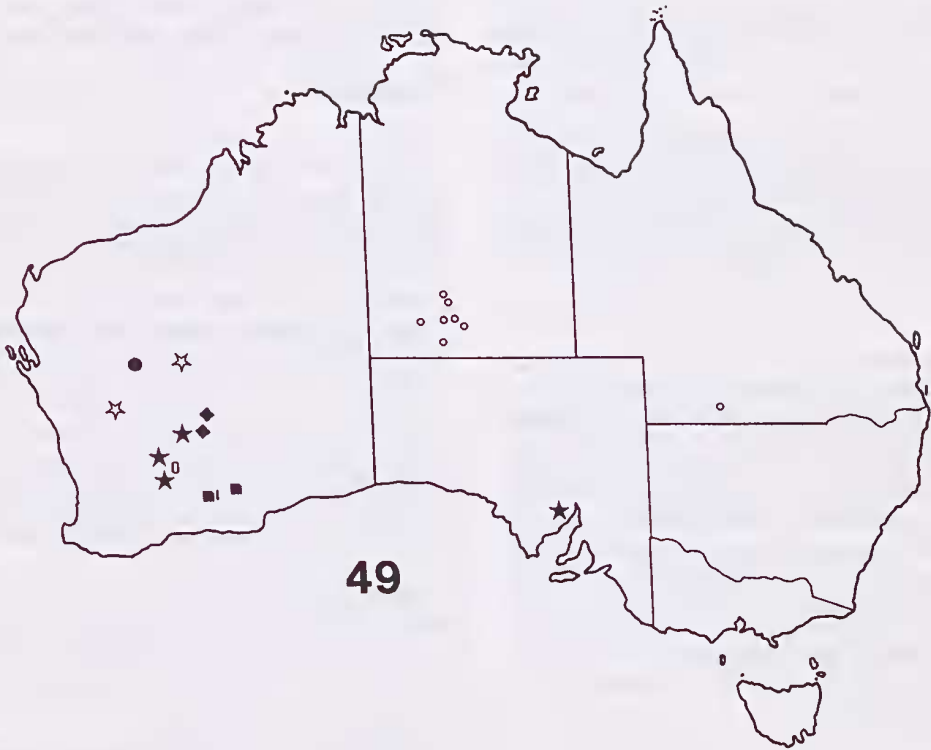
Paratypes

Australia: Western Australia: 9 ♂, same data as holotype (WAM, UQIC).

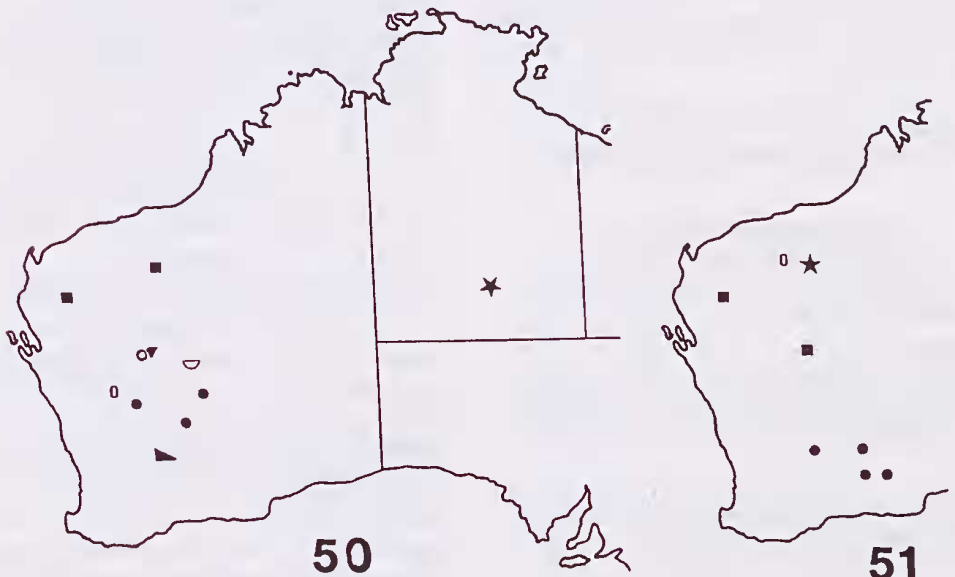
Description

Female

Length about 6.0 mm; wing length about 4.5 mm. Relative head measurements: width 9.0; length 9.0; clypeal length 2.8; lower interocular distance 5.6; upper interocular distance 5.9; clypeo-antennal distance 0.4; interantennal distance 2.0; antennocular distance 1.2; interocellar distance 1.8; ocellular distance 1.6. Anterior margin of clypeus broadly truncate; upper margin of clypeus faint, slightly concave; labial palps exceedingly elongate,



49



50

51

Figures 49–51 49 Known distribution of *Euryglossa* (*Euhesma*) species. Group 1. ○ *E. atra*; ▾ *E. aurata*; ■ *E. balladonia*; ◆ *E. leonora*; ☆ *E. nalbarra*; ★ *E. scoparia*; ○ *E. sturtiensis*; ● *E. symmetra*. 50 Known distribution of *Euryglossa* (*Euhesma*) species. Group 2. ★ *E. alicia*; ■ *E. cuneifolia*; ○ *E. granitica*; ○ *E. meeka*; ● *E. pantouii*; ▾ *E. sulcata*; ◊ *E. wiluna*; ▴ *E. yellowdinensis*. 51 Known distribution of *Euryglossa* (*Euhesma*) species. Group 3. ○ *E. coppinensis*; ■ *E. macrayae*; ★ *E. newmanensis*; ● *E. walkeri*.

longer than head, segments in increasing length in the order 1, 4, 3, 2 with 2, 3 and 4 flattened, ribbon-like and apparently channelled medianly; horizontal zone of propodeum longer than metanotum.

Labial palps with segment 1 dark brown, segments 2, 3, 4 yellowish with 2 infused with brown. Legs dark brown with tarsi yellowish.

Long white hairs on clypeus, frons, posterior genae, mesoscutum, scutellum, metanotum, sides of propodeum, sides of thorax, legs, venter.

Male

Length about 6.0 mm; wing length about 4.5 mm. Relative head measurements (Figure 19): width 9.0; length 8.0; clypeal length 2.0; lower interocular distance 6.0; upper interocular distance 6.0; clypeo-antennal distance 0.2; interantennal distance 2.0; antennocular distance 1.4; interocellar distance 1.9; ocellocular distance 1.5. Anterior margin of clypeus gently convex; upper margin of clypeus not clear; facial foveae not evident; labial palps as in female; horizontal zone of propodeum longer than metanotum. Colour as in female, with labial palps with segment 1 dark brown, segment 2 brown, segments 3 and 4 yellowish. Terminalia as in Figures 30, 38 and 47.

Remarks

This is the only species in which the head of the female is not longer than wide. The head of the male is wider than long. The cup-like tip of the gonostylus of the genitalia (Figure 30) has not been seen elsewhere.

Etymology

The specific name refers to the type locality.

Euryglossa (Euhesma) macrayae sp. nov.

Figures 7, 8, 12, 16, 18, 28, 29, 36, 48, 51

Material Examined

Holotype

♀, 85 miles (136 km) NNE of Meekatharra, Western Australia, 30 July 1971, T.F. Houston, on blue *Eremophila* (WAM).

Paratypes

Australia: Western Australia: 10 ♀, 5 ♂, same data as holotype (WAM, UQIC, ANIC).

Other Material

Western Australia: 7♀, 8 km S of Lyons River Homestead, 24°38'S 115°20'E, 30 August 1980, on *Eremophila platycalyx* var. *lancifolia* (WAM 341-1); 2♀, same data, 16 km WSW of Lyons River Homestead, 30 August - 1 September 1980, on

Eremophila cuneifolia Kraenzlin (WAM 344-11); 1♀, same data on pink *Eremophila* (WAM 344-13).

Description

Female

Length about 7.0 mm; wing length about 5.0 mm. Relative head measurements: width 9.5; length 10.4, clypeal length 3.3; lower interocular distance 6.0; upper interocular distance 6.6; interantennal distance 2.2; antennocular distance 1.5; interocellar distance 2.0; ocellocular distance 1.9; ocelloccipital distance 0.8. Anterior margin of clypeus indented medianly, upper margin of clypeus slightly concave; labial palps (Figures 7, 16) exceedingly elongate, longer than head, segment 1 shortest, segments 2, 3, 4 about equal; facial foveae broad shallow depressions nearly 1/2 length of eyes; malar space short; horizontal zone of propodeum about as long as metanotum; clypeus shining; foveae of second segment of gaster about 1 1/2 times as long as wide.

Labial palps with segment 1 dark brown, segment 2 with basal half dark brown, distal half golden brown, segments 3 and 4 with basal half whitish, distal half golden brown; legs with coxae and trochanters black, all femora dark brown, tibiae and tarsi yellowish-brown.

Scattered long yellowish hairs on frons above antennae, vertex, clypeus, clypeal margin; shorter white hairs on dorsum of thorax, sides of propodeum; longer scattered white hairs on posterior genae, sides of thorax, legs, gastral sternae; long yellowish hairs on gastral terga 5 and 6.

Male

Length about 6.0 mm; wing length about 4.8 mm. Relative head measurements: width 7.3; length 7.3; clypeal length 2.1; lower interocular distance 4.6; upper interocular distance 5.1; clypeo-antennal distance 0.6; interantennal distance 1.4; antennocular distance 1.2; interocellar distance 1.4; ocellocular distance 1.4; ocelloccipital distance 0.9. Anterior margin of clypeus indented medianly, upper margin of clypeus slightly concave; labial palps (Figure 18) as in female; facial foveae broad, shallow, indistinct; malar space short; inner hind tibial spur finely pectinate; horizontal zone of propodeum about as long as metanotum; foveae of second segment of gaster about 3 times as long as wide. Colour as in female except legs orange with coxae black. Scattered long white hairs on frons, clypeus, mandibles, vertex, posterior genae, dorsum of thorax; longer scattered white hairs on sides of thorax, legs, venter. Terminalia as in Figures 28, 29, 36, 48.

Remarks

Although the specimens from Lyons River

area were taken from different species of *Eremophila*, I cannot separate them. None is as robust as the specimens from Meekatharra and when males are known a different species may be indicated.

Etymology

This species is named for my niece Elizabeth McCray whose typing skills greatly helped preparation of this manuscript.

Euryglossa (*Euhesma*) *newmanensis* sp. nov.

Figure 51

Material Examined

Holotype

♀, 14 miles (22.4 km) NE of Newman, Western Australia, 28 August 1971, T.F. Houston, on *Eremophila* (WAM).

Paratype

Australia: Western Australia: ♀, same data as holotype (WAM).

Description

Female

Length about 7.0 mm; wing length about 5.0 mm. Relative head measurements: width 8.9; length 10.1; clypeal length 2.9; lower interocular distance 5.9; upper interocular distance 6.1; interantennal distance 2.0; antennocular distance 1.2; interocellar distance 2.0; ocellocular distance 1.6. Labial palps as long as head with segment 1 shortest, segments 2, 3, 4 about equal in length.

Etymology

The specific name refers to the type locality.

Euryglossa (*Euhesma*) *walkeri* sp. nov.

Figure 51

Material Examined

Holotype

♀, 40 km N of Norseman, Western Australia, 31°52'S 121°47'E, 20 November 1989, K.L. Walker, on *Eremophila* (MV).

Paratypes

Australia: Western Australia: 2♀, same data as holotype, 5♀, 35 km E of Norseman, 32°12'S 122°04'E, 30 October 1989, K.L. Walker, on *Eremophila*; 1♀, 31 km S Norseman, 32°27'S

121°47'E, 31 October 1989, K.L. Walker, on *Eremophila* (MV, UQIC).

Other Material

Western Australia: 1♀, 31°07'S 121°24'E, 29 km SE by E of Coolgardie, 11 October 1981, (ANIC); 2♀, So[uthern] Cross, 19 November 1979, on *Eucalyptus* (RMBM); 1♀, 70–75 km ENE of Norseman, 10–16 November 1978, on flowers of *Eremophila scoparia* (WAM).

Description

Female

Length about 4.5 mm; wing length about 3.0 mm. Relative head measurements: width 6.3; length 7.0; clypeal length 1.8; lower interocular distance 3.4; upper interocular distance 4.1; interantennal distance 1.4; antennocular distance 0.5; interocellar distance 1.4; ocellocular distance 1.1. Upper margin of clypeus straight; labial palps longer than head, segments in increasing length in the order 1, 4, 3, 2 with 1 and 2 cylindrical and widest. Frons above antennae with obvious evenly-spaced punctures and very distinct frontal line; supraclypeal area and clypeus shining, concave, with fewer punctures.

Labial palps with segments 1 and 2 dark brown, 3 and 4 yellowish. Legs dark brown with tibiae and tarsi golden.

Long white hairs plentiful on ventral body surface and legs.

Etymology

The specific name honours Dr Ken Walker, the collector of this species with whom I've spent many hours collecting and discussing bees.

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